

# California MEDICAL ASSOCIATION

## NOTICES & REPORTS

### The Treatment of Cancer with Arginase

*A Report by the Cancer Commission of the California Medical Association*

IN THE SUMMER of 1951, inquiries were made of various members of the Cancer Commission of the California Medical Association concerning the usefulness of arginase in the treatment of human cancer. These inquiries were stimulated by the publication of a "Symposium on Arginase in Cancer Research" in a bulletin issued by a medical foundation in California, and by reports emanating from a physician connected with the Hollywood Presbyterian Hospital. The commission conducted an investigation into the nature of the treatment and the results attributed to it.

#### 1. Nature of Treatment Method

Arginase is an enzyme which occurs in the liver and other mammalian tissues. It is said to split arginine into urea and ornithin. It is apparently of relatively low concentration in malignant tissue. Attempts have been made for some years to treat cancer with arginase, the drug having been given by various parenteral routes, notably by vein. The question arises from time to time as to the quality and purity of the arginase being used, and as to the possibility of contaminants being the "beneficial" factor, if such exists. The name of the agent was changed by one group to hepasyn in 1953.

#### 2. Proponents

The persons prominent in the current arginase discussion are essentially as follows:

Wesley G. Irons, D.D.S., formerly connected with the University of California College of Dentistry.

Ved Vrat, a Hindu biology student, formerly associated with Dr. Irons and subsequently connected temporarily with the Permanente (Kaiser) Foundation.

E. Forrest Boyd, M.D., a Los Angeles physician and surgeon, formerly Chief of Staff at the Hollywood Presbyterian Hospital.

Leo W. Hosford of San Francisco, a drugless practitioner (graduate of the San Francisco College of Drugless Physicians, 1934) and operator of a mortuary college.

*Dr. Irons* was graduated as a dentist in 1922 and practiced for some years in San Jose. From 1922 to 1943 he worked variously as a student at the University of Southern California, as an anatomist in the Walt Disney Studios, as a director of "research" in the Kern County General Hospital, and reportedly as a shipping clerk and a high school teacher. From 1943 until 1950 he was an instructor in the U. C. College of Dentistry. His interest in cancer reportedly began in 1939 when a relative died of the disease. He apparently became convinced that arginase could control or cure cancer, and proceeded to experiment with it. In 1949, Irons and Vrat were associated briefly. Then Vrat left to join Permanente.

In February 1950, application for a research grant was filed with the Committee on Growth of the National Research Council, from the American Institute of Radiation, in which Dr. W. G. Irons was listed as principal investigator and "Ved Vrat, Histologist" as chief assistant. In August 1950, a letter

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that requested withdrawal of the application stated: (1) that Dr. Irons was no longer with the American Institute of Radiation, and (2) that "the Institute is now under the sponsorship of the Permanente Medical Foundation, and has severed all connections with the Electronic Medical Foundation of San Francisco."

Mr. Vrat came to the United States from India in 1946. He entered Stanford but failed to complete the requirements for Ph.D. in the biological sciences. He was disqualified by the University after eight quarters. In 1949 he was a laboratory technician at the Richmond (Calif.) Hospital and in 1950 was listed as Director of Cancer Research at the Permanente Foundation.

In July 1951 Mr. Vrat published three articles indicating control of mouse cancer by arginase in the *Permanente Foundation Medical Bulletin*. Subsequently, Dr. Sidney Garfield, then director of that foundation, asked the Cancer Commission for a list of the names and addresses of physicians in the United States interested in cancer control, in order to send them the *Bulletin*. By October 1951 the rumors concerning a new cancer "cure" reached such proportions that the following letter was released by the Permanente Hospital to the secretary of the Cancer Commission and others:

THE PERMANENTE HOSPITALS  
Broadway and MacArthur Blvd.  
Oakland 11, California  
October 9, 1951

Dear Doctor:

It has come to our attention that there are rumors regarding a claim for cancer cure by the use of arginase and it has been attached to the Permanente Foundation.

We have been working with arginase in the treatment of some mouse transplants of cancer with encouraging results. These results have been published, a copy of which is enclosed. We have used arginase on two patients; one a primary carcinoma of the breast, inoperative, with metastasis to the brain and lung. This patient died during the course of treatment. A second patient with a synovium of the knee joint, treated by amputation of the leg, but with present widespread metastasis to the lung was treated. To date, this patient has shown no encouraging response to the arginase treatment. These are the only patients that have been treated by any member of the Permanente Hospital or by arginase prepared by our Research Department.

We understand there are other groups, particularly in Southern California, who are using some form of arginase therapy on patients, but we have absolutely no connection either personnel or materialwise with these groups.

I assure you that we have made no claims to cure cancer, as the results of the two patients that we have treated would indicate. Our work is being carefully controlled and we have no intention of publicizing the use of arginase on humans until proper scientific results are obtained. Very truly yours,

THE PERMANENTE HOSPITALS  
(signed) C. C. Cutting, M.D., Chief of Staff

In 1953 Vrat treated some leukemic mice supplied by Dr. A. C. Griffin of Stanford and claimed beneficial results. Mimeographed copies of a manuscript bearing his and Dr. Griffin's name were released in the East and caused a flurry of excited speculation. The manuscript was withdrawn at Dr. Griffin's insistence.

In August 1952 Vrat's connection with the Permanente (Kaiser) Foundation was terminated. Dr. Eaton M. MacKay reportedly continued but did not publish further arginase studies.

Dr. Boyd is a Los Angeles physician and surgeon who was graduated from Stanford School of Medicine in 1919.

Mr. Hosford is a drugless practitioner who operates the San Francisco College of Mortuary Science. In 1950, along with Drs. Irons, Boyd and others, he founded the *Charles E. Irons Memorial Cancer Foundation*. This was incorporated on June 4, 1951, and steps were reportedly taken to raise some \$135,000.

Mr. Hosford aided Mr. Vrat and Dr. Irons in their arginase work. He notified the dean of one of the medical schools in California that excellent results were being obtained in cancer, using arginase.

On April 21, 1953, Mr. Hosford addressed to the San Francisco, the California, and the American medical associations the following letter:

SAN FRANCISCO COLLEGE OF MORTUARY SCIENCE  
America's Premier College  
1450 Post Street, San Francisco 9, California  
JORDAN 7-0674 and 7-0675

April 21, 1953

Office of the President  
DR. L. W. HOSFORD

American Medical Association  
535 North Dearborn  
Chicago, Illinois  
Gentlemen:

We are sponsoring, in collaboration with the Charles E. Irons Memorial Cancer Foundation, a project in basic research with relation to malignancy.

Heretofore, clinical work on humans has been carried on in Los Angeles under the supervision of E. Forrest Boyd, M.D.

We are now setting up an institutional research project at our college at 1450 Post Street, San Francisco, California. We earnestly urge your full and complete cooperation. Should you be interested in this project and in cooperating with us, would you be good enough to advise us, and we will then endeavor to work out arrangements with you as to the nature and extent of your cooperation.

Very truly yours,

SAN FRANCISCO COLLEGE OF MORTUARY SCIENCE  
Dr. L. W. Hosford, President

This was acknowledged by the Cancer Commission on April 23, 1953, with a request for information concerning the "institutional research project." No reply was received.

Since the Commission was receiving inquiries

about the cancer treatment project, the secretary of the Commission visited the college on April 30, 1953. He found a small treatment unit, with a few outpatients waiting to be seen by Dr. M. P. Ream of San Leandro. He was informed that Dr. Boyd visited the unit only on Tuesdays or Wednesdays. There were no bed patients. In one room was a gynecological table, without any visible examining instruments or linen. No nurses were visible. A full report of the visit is available in the files of the Commission.

While Dr. Hosford wrote to the medical associations on College of Mortuary Science letterhead, he addressed a prospective patient on Memorial Foundation paper as follows:

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| <i>President-Research Director</i><br>WESLEY G. IRONS,<br>D.D.S., A.B., M.A., M.S. | <i>Secretary-General Manager</i><br>LEO W. HOSFORD, D.P.M.        |
| <i>Vice-President-Medical Director</i><br>E. FORREST BOYD,<br>A.B., M.D., F.I.C.S. | <i>Treasurer-General Counsel</i><br>EUGENE U. BLALOCK, A.B., J.D. |

CHARLES E. IRONS MEMORIAL CANCER  
FOUNDATION

April 14, 1953

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| <i>Directors</i><br>Wesley G. Irons,<br>D.D.S., A.B., M.A., M.S.<br>E. Forrest Boyd,<br>A.B., M.D., F.I.C.S.<br>Leo W. Hosford, D.P.M.<br>Eugene U. Blalock, A.B., J.D.<br>George E. Chapman, M.D.<br>George H. Hauerken, LL.B., LL.M.<br>Leon S. Utter<br>Edward M. Elliott<br>J. L. Cannon | <i>Principal Office</i><br>1450 Post Street<br>San Francisco 9, California<br><br><i>Branch Office</i><br>727 W. Seventh Street<br>Los Angeles 17, California |
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Miss C.  
Grandview Boulevard  
Los Angeles 34, California

Dear Miss C.:

At last we are able to announce the opening date of our new cancer research treating center in San Francisco, which will be the central point of research of our organization.

The date will be Monday, April 27th, at 1450 Post Street, which is the college building of the San Francisco College of Mortuary Science, the institution under whose auspices this project has been made possible.

Doctor Irons, Doctor Boyd and myself will all be in New York the latter part of this week for a few days and will return to get the treatment started as above stated, on April 27th.

Would you please write me by return mail letting us know if you are still interested in taking these treatments. Would you also see that all of your records together with their biopsies, x-ray reports, etc., etc., are referred to E. Forrest Boyd, M.D., Supervisor, Research Center, 1450 Post Street, San Francisco 9, California. Please do this immediately so we can know how many will arrive and have all applications for treatment in well in advance so there can be no delay in carrying out the program. Doctor Boyd, as stated, will be the Medical Supervisor, and is a man with whom you are all acquainted.

Looking forward to seeing you and your mother on the above date, and hearing from you at the earliest date possible, I am,

Sincerely yours,

DR. L. W. HOSFORD  
General Manager

### 3. Experimental Evidence Offered

No formal experimental evidence was offered to the Cancer Commission by the proponents of arginase in 1951. However, a paper reporting some experimental work was subsequently published by Drs. Irons and Boyd in *Arizona Medicine*. This paper quoted a 1946 publication of Irons (*Journal of Dental Research*, 25:497) dealing with subcutaneous and intraperitoneal injection of arginase prepared from fresh beef liver and the reactions thereto in twenty Hamilton-strain white mice. It also quoted a 1947 paper by Irons and Wiswell (*Science*, 106: 2756) reporting some tests on C<sub>3</sub>H cancer-strain mice. A number of mice with "spontaneous mammary carcinomata" were injected with arginase: "The tumors shrank; differential staining methods (Von Kossa) for calcium were positive."

One animal was given arginase daily for three days. "Five days later when the tumor was removed, decalcification was necessary before this mass could be sectioned for microscopic examination."

One animal was given arginase directly into the mesial half of the tumor. After three days "histological examination showed the distal portion to be typically malignant, while the proximal half presented a picture of innocence."

The authors concluded that direct intratumoral injection of arginase produced effects identical with intraperitoneal administration—namely, a 28 per cent reduction in general tumor growth, and a 26 per cent decrease in the ratio of tumor length to weight.

### 4. Clinical Evidence Offered

At the request of the Cancer Commission, and by invitation of Dr. E. F. Boyd, Dr. Ian Macdonald was present at a demonstration of clinical results presented to the Cancer Committee of the Hollywood Presbyterian Hospital on February 20, 1952. Two groups of patients were discussed. The first ten had been observed by a subcommittee of the cancer committee of the hospital; the second ten were cases chosen by Dr. Boyd as being perhaps more representative of results.

Case histories were presented as follows:

(1) Mrs. G., an 88-year-old woman with a breast tumor since 1949. When first seen by the Tumor Board the left breast was completely infiltrated, with ulceration of the skin; there were bilateral axillary and left supraclavicular nodes. Treatment with arginase began on Aug. 6, 1951. Fifty-nine treatments were given. The patient died on Oct. 6, 1951. The pathologist, Dr. Andrews, stated that the original biopsy showed a well-differentiated carcinoma, and that the same neoplasm was seen in sections from the autopsy, with areas of necrosis and fibrosis. The was *no difference* in the pre- and post-treatment microscopic sections.

(2) Mr. H., a 62-year-old male with bronchogenic carcinoma proven by biopsy on July 19, 1951. He had dyspnea, weakness and cough; pleural fluid was aspirated but showed

no cancer cells on smear. Treatment began on July 13, 1951, a total of 50 treatments with arginase was given and the patient died on September 9, 1951. Dr. Benz [radiologist] reported that the major portion of the left side of the chest was opaque, that there was a posteriorly placed mass and there was an osteolytic metastasis to the left scapula. Mrs. Hilliard [laboratory technician] reported that the anti-enzyme values indicated a rapid process and that the antichymotrypsin rose steadily under treatment.\*

(3) Mr. M., a 37-year-old male with a history of two to three years of diarrhea. On Aug. 24, 1950, a colon resection was done for carcinoma of the sigmoid, at which time metastases to the liver were present. In January 1951 he had pain along the left costal margin and in the left shoulder and by May 1951 had lost 40 pounds in weight. On July 20, 1951, there was a large lower abdominal mass and treatment with arginase was begun. By Aug. 3, 1951, there were no changes in physical findings but the patient was undergoing progressive deterioration and died on Aug. 21, 1951. Dr. Andrews reported that the surgical specimen showed a fairly well differentiated adenocarcinoma and that a biopsy of the liver showed the same neoplasm. At autopsy the carcinoma was still well differentiated, there was fibrosis and degenerative change. Dr. Benz stated that a gastrointestinal series showed gastroduodenal and enterocolic fistulae. Mrs. Hilliard reported that 33 determinations of antienzymes in blood serum were done and 23 determinations of urinary uropepsins with no evidence of improvement in the pattern at any time. The later findings indicated good adrenal function at first which became worse after treatment began.

(4) Mr. M., a 46-year-old male. In January 1949 developed a lump in the right knee which became larger and was biopsied in June 1949 and showed a fibrosarcoma. On July 25, 1951, the primary lesion measured 9 x 9 x 5 cm. Sixty-seven treatments with arginase were given and the mass was thought to be possibly smaller and softer. The patient had metastases to regional nodes and lungs. Amputation was done. Dr. Andrews stated that the original biopsy showed an active fibrosarcoma with many mitotic figures. The amputation specimen showed necrosis of the tumor with no mitotic figures. There was a collagen increase. Dr. Boyd reports that the patient now has considerable weakness and a cough. He has had no treatment since December 1951. Dr. Benz demonstrated bilateral pulmonary metastases and six weeks after treatment began all of the metastases were increased in size. Mrs. Hilliard reported that the anti-enzyme pattern showed no improvement.

(5) Mrs. V., a woman with age not given. Developed swelling and retraction of the nipple in January 1950 and an increasing mass in the breast. In December 1950 there were multiple involved nodes in the left axilla. The patient had weakness and pain in the back. Ninety-six treatments with arginase have been given since July 19, 1951, at which time the left breast contained a 6 x 8 cm. central tumor, and there were multiple enlarged hard fixed nodes in the left axilla. Biopsy on Aug. 29, 1951, showed metastatic adenocarcinoma. Last examination on Feb. 19, 1952: The primary lesion of the breast measured 8 cm. in diameter, there was a left axillary mass 3 x 3 cm., the liver edge was hard and irregular and there was a hard mass occupying the umbilicus. This patient stated that she "feels no better." Dr. Andrews stated that the lesion was a well-differentiated adenocarcinoma with fibrosis and no mitoses. Dr. Benz reported that the chest showed pulmonary fibrosis with no evidence of metastases. Mrs. Hilliard reported that the anti-

chymotrypsin fell from 6.5 before treatment to 5.0 in October but by November had risen unfavorably to 8.5.

(6) Mrs. E., a 40-year-old woman. In May 1950, noted a tumor in the breast which subsequently was treated with Koch serum, testosterone and Premarin® with gradual increase in size of the breast tumor. On November 14, 1951, the breast was small, hard and fixed to the chest wall; there was involvement of the axillary nodes on the right side and bilateral supraclavicular node involvement. A biopsy showed scirrhous carcinoma. This patient had 121 treatments with arginase and last examination on Feb. 18, 1952, showed that the mass in the breast was larger, with more skin involvement, and moderate increase in involvement in the axillary nodes which were now fixed to the scapula. She had gained weight. Dr. Andrews stated that he had no microscopic section to review. Dr. Benz said that radiographic examination showed no evidence of metastases. Mrs. Hilliard reported that six determinations had been done. The last one on Dec. 18, 1951, showed unfavorable progress.

(7) Mr. X., a male, aged 56, name not available. In December 1950, nephrectomy was done for a carcinoma of the renal cortex. In June 1951, fractured the right forearm and complained of pain in the back with demonstration of metastases and x-ray treatment to both areas. This patient had had 68 treatments with arginase although the date of beginning such treatment was not stated. At last examination, Feb. 19, 1952, the patient said he felt better but he had severe anemia, was more emaciated, weaker and dyspneic. There was a mass in the right side of the abdomen with induration of the entire abdominal wall. Dr. Andrews reported that slides made elsewhere were typical of a clear cell carcinoma with areas of degeneration and hemorrhage. Dr. Benz demonstrated pyelographic studies done elsewhere with a mass at the lower pole of one kidney. In October there was radiographic evidence of metastases to the ribs and lungs and the last examination in February 1952 showed a mass of pleural effusion filling the entire right side of the chest, extensive destruction of ribs, new pulmonary lesions and a pathological fracture of one radius. Mrs. Hilliard reported that ten tests had been done from November through December showing a moderately progressive pattern, and no essential change.

(8) Mrs. B., a 50-year-old woman. From 1929 to 1930 she had x-ray treatment to her leg for removal of hair. In 1942 she injured her patella and an ulcer developed in this area which became larger and then improved but did not heal. In 1947 a "cyst" of the patella was removed which on microscopic examination showed epidermoid carcinoma. A graft was used for closure. From 1947 to 1951 the patient was well until she suffered another injury to the leg with new ulceration and pain for which a sympathectomy was done. When seen on Nov. 26, 1951, the right leg showed an indolent granular ulcer at the site of the previous operation and on Dec. 18, 1951, biopsy showed epidermoid carcinoma Grade I to II. Since the above time she had been on treatment with arginase, number of treatments not stated. The patient was presented to the group on Feb. 20, 1952, and on questioning said that she felt better. There were three areas of ulceration 2½ x 1¼ inches and 1 inch and ½ inch respectively in size and the base of these ulcers was reported as being "thicker." Dr. Andrews reported the original biopsy and said that there had been no additional biopsy. Dr. Benz reported that radiographic studies showed no change.

(9) A 32-year-old male, name not obtained. In March of 1950 a tumor in the right axilla was biopsied and showed

\*Dr. Philip West and Mrs. Hilliard reported on the response of patients by means of the antichymotrypsin and antirennin values of blood serum.

metastatic carcinoma, primary site undetermined. Eight x-ray treatments were given at the Los Angeles Tumor Institute. In February 1951 there was recurrence of the axillary lesion with pain in the shoulder. In May 1951, further x-ray treatment was given. In November 1951 pain recurred with diffuse rales in the lungs and winging of the right scapula. Thirty-two treatments with arginase were given and the patient died one month after beginning treatments. Dr. Andrews reported that autopsy showed a primary carcinoma of the ileum with metastases to the brain and death from cerebral hemorrhage. The microscopic section showed no evidence of change from the treatment given. Dr. Benz reported radiographic findings of hilar adenopathy and miliary pulmonary metastases, which grew progressively.

(10) Mrs. W., a woman, aged 57. In November 1950 a lump in the breast was found and in January 1951, biopsy showed cancer. The lesion, however, was in the underlying chest wall and she went to the Mayo Clinic where some surgical procedure was done and ten x-ray treatments were given and some months later four x-ray treatments were given. The excised material showed chondrosarcoma. Treatment with arginase began on Aug. 12, 1951, and 198 treatments were given. Examination on Feb. 19, 1952, showed around the inframammary scar several soft small nodules; the fourth rib was thickened and stony hard. There was also a chondrocostal mass in the area of the seventh rib. At this point it was learned that on Feb. 1, 1952, the patient had a resection of the chest wall by Dr. Bert Cotton but the disease was so extensive that residual tumor was left attached to the pericardium. Dr. Andrews reported that comparison of the original sections from the Mayo Clinic with the surgical specimen of Feb. 1, 1952, showed definite changes following treatment with arginase, consisting of increase in fibrous tissue with degeneration of cartilage and encapsulation of the tumor.

Dr. Boyd then announced that the present review of his project was being done over his protest, and the reasons for protest were: (1) inadequate time had elapsed to permit proper evaluation; (2) the dose of arginase had not been established as he now gives 20 times greater dosage than at the beginning of the project; (3) an attempt at evaluation on the basis of inadequate evidence is unscientific. He said on the other hand if present review was for a guide as to future conduct of the project, that was satisfactory. He stated that, for the benefit of the representative of the Cancer Commission, the choice of the ten cases supervised by the committee at the Hollywood Hospital was their own and not his. Three of these cases he said fell short of one of the criteria, that they failed to survive for six months after the beginning of treatment. A fourth case he stated was an unfair selection. Concerning Case No. 5 listed above, he thinks there is little difference between the patient's condition now and before treatment. Case No. 6 he thinks should be discarded although he gave no reason for this belief. Dr. Boyd stated that in all over 8,000 doses of arginase given intravenously there had been no death due to the use of the drug in a total of 125 cases. He said that arginase reduces the amount of narcotic the patients require, that they are happier, that some of them gain weight, and that 20 of the patients he has treated have returned to their full-time occupations. He stated that Case No. 10 above was pronounced by the Mayo Clinic to be inoperable, and that arginase made the lesion operable. He said that live patients are all that count and one should see the patients to be convinced of the value of the treatment. Patient No. 10 listed above then was brought in. She embraced Dr. Boyd affectionately and stated that she felt wonderful.

(11) Dr. Boyd then showed a Mrs. N. who had metastases to the left lung from a carcinoma of the breast as demonstrated on Jan. 5, 1950. On April 28, 1950, there was radiographic evidence of lymphogenous involvement of the lung and by June 6, 1951 the left lung was completely obscured. This patient had x-ray treatments in February, March and June 1951 and also had testosterone during these months. Dr. Boyd did not say how much arginase this patient had had or when the treatment began. On Oct. 13, 1951, Dr. Benz showed films with extensive changes in the left lung which he interpreted as being postradiation, as x-ray treatment had been given to the entire left side of the chest. The radiographic appearance in January 1952 was static. Dr. Boyd claimed credit for arginase that this patient was well and had been back at work for ten months.

(12) A child was then shown who at 18 months of age in May 1950 developed epileptic seizures, and was admitted to Children's Hospital in January 1951. Exploration showed a glioblastoma of the third ventricle, a biopsy being done at that time. The child had been under treatment with arginase since May 14, 1951, still had seizures and when shown to the group had severe strabismus, was unable to walk a straight line; and it was stated that at home the child was equipped with a small football helmet to prevent injury to the head because of her constantly walking into walls and objects in the room. Dr. Boyd stated that since treatment with arginase the child's "word power" had improved. It was then learned that following the exploration the child received x-ray therapy given by Dr. Robert Freeman in Pasadena.

(13) A child about age three (J.R.) on Sept. 7, 1951, showed a lump on the back of the head which was biopsied and showed fibrosarcoma. Films in Sept. 1951 showed an osseous defect in the occipital bone from without, a sharply demarcated area. The soft tissue tumor was surgically resected, after which treatment with arginase was given. Films taken in January and February showed progressive healing of the former bone defect so that now it is completely bridged by callus. Dr. Benz interpreted these radiographic findings in the skull as being most likely due to pressure erosion of the overlying tumor with an aseptic osteomyelitis. Dr. Boyd maintained that the bone was destroyed and that healing was due to arginase.

(14) A 59-year-old male (Mr. R.) had an adenocarcinoma of the lung proven by bronchoscopic biopsy in October 1951. He was dyspneic and it was difficult for him to talk when treatment was begun with arginase in October, since which time 112 treatments had been given. The patient was shown to the group. He said he still had some cough and had nausea from the medicine which he received but no longer had bloody sputum. Radiographic findings on June 12, 1950, and Nov. 2, 1950, showed a slowly growing lesion at the right hilum, on Jan. 2, 1951, atelectasis of the right upper lobe, on Oct. 25, 1951, extensive involvement of the right lower half of the lung. Further x-ray examination on Jan. 15, 1952, showed a right pneumothorax following an exploratory operation at Sawtelle, while on Feb. 18, 1952, the entire right side of the chest was completely dense.

(15) A woman, Mrs. S., age not given, developed abnormal uterine bleeding in 1948, and was treated by surgery and irradiation at intervals up to 1951 for metastases invading the pelvis from a primary adenocarcinoma of the uterine cervix. Gastrointestinal x-ray examination on Feb. 5, 1952, showed a partial small bowel obstruction and the presence of a lower abdominal mass. Prior to this time the patient had had 100 treatments with arginase and Dr. Boyd stated that the perineal floor which was tight had now be-

come relaxed. At surgery on Feb. 12, 1952, the right half of the colon and some of the ileum was resected. Pathological examination showed the specimen to consist of a mass of loops of bowel bound together by dense fibrosis with a few small foci of cancer cells stated by Dr. Andrews to be present. Mrs. Hilliard reported that this patient was always in positive nitrogen balance.

(16) A Mrs. S., who had an adenocarcinoma of the right breast and radiographic examination Nov. 29, 1951, showed bilateral pleural effusion with nodular densities in the left pulmonary field. On Feb. 18, 1952, effusion was less and there were areas of patchy atelectasis. This woman's original treatment was on Feb. 20, 1951, when she had a right radical mastectomy and this was followed by postoperative x-ray therapy. On five occasions pleural fluid had been aspirated but no smears were obtained. She had severe dyspnea at the time the abnormal radiographic findings were demonstrated and Dr. Brown (radiologist) indicated his belief that the findings at that time were more consistent with cardiac failure than with metastatic disease.

(17) A 33-year-old woman (Mrs. S.) had a squamous cell carcinoma of the uterine cervix for which irradiation was given in February 1949, at the Hollywood Hospital. Following this she was stated to have an abdominal mass. On Feb. 6, 1951, treatment with arginase was begun and Dr. Boyd stated that the patient was now perfectly normal, and it was possible now to do a pelvic examination whereas this was not possible before arginase was given. Dr. Brown stated that the lesion was treated with 7,000 milligram-hours of radium and that x-ray treatment was given from Aug. 29 to Oct. 25, 1949, and from December to January 1950, there was a depth dose of 8,000 r in the midpelvis and 4,000 r in the perimetria. On Jan. 13, 1950, examination by Dr. George Sharp showed no evidence of disease.

(18) A male, age and name not obtained, on March 10, 1951, had a pneumonectomy at Sawtelle for a squamous cell bronchogenic carcinoma in the left lower lobe with infiltration of the pulmonary vein. On May 14, 1951, he began arginase treatment and he was said to have gained 40 pounds in weight and to be working regularly although he had a chronic cough. Serial radiographic examinations were reported from Sawtelle as showing no change since the operative procedure.

(19) A woman with carcinoma of the cervix, name and age not obtained, with spread to retroperitoneal nodes, had exploratory operation elsewhere and was brought to Hollywood Hospital by ambulance. The onset of her disease was in February 1950 with uterine hemorrhage, and on July 6, 1951, she was explored and said to be inoperable. Then Dr. Boyd stated that the microscopic diagnosis was leiomyosarcoma of the uterus with abdominal spread. Before beginning treatment with arginase she had had two abdominal masses; she now had three and she would soon be eligible for surgical treatment.

Dr. Boyd then summarized his ideas by saying that arginase had prolonged the lives of 40 patients long beyond their natural expectancy, that 21 of them are back at work, that there has been no damage in any instance, and that some inoperable cancers have been converted to operable. He said that if his premise is correct new vistas are being pioneered. Radiographic findings must be interpreted in an entirely new light (as in cancer of the lung which may seem to be growing denser under treatment, due to fibrosis and deposit of calcium in the tumor with arginase).

He also stated that this treatment opens a new field in microscopy and that new methods of staining and study of tissue are necessary to interpret properly the changes in cancer produced by arginase.

Surgery has an entirely new future in the treatment of cancer, he said, as more than 50 to 75 per cent of cancers can be made operable, he said, by treatment with arginase. Dr. Boyd stated he had a number of patients then waiting for operation who have been made operable by treatment with arginase.

The internist also has a new vista in the field of cancer, Dr. Boyd said, with different symptoms to be interpreted in the light of this new treatment with the necessity of supporting adrenal function along with the use of arginase. He mentioned that insulin does not cure all diabetics.

Dr. Boyd stated that four years of work and a vast amount of money are required. The patients so far treated have spent more than \$150,000 at the Hollywood Hospital. Cutter Laboratories, he said, had signed to pursue the investigation of arginase and had assigned a full-time research man to begin work at the Hollywood Hospital in the week of Feb. 25, 1952. [Cutter Laboratories later withdrew. See later paragraph: 9. *Consultant and Other Reports.*]

(20) Dr. Rusche was then asked by Dr. Boyd to describe a case of his, and Dr. Rusche stated that the man had carcinoma of the bladder which after treatment was less vascular, but that there was now extensive spread of tumor posterior to the bladder.

This concluded the session.

### 5. Autopsy Data Offered

The proponents offered no autopsy data to substantiate statements that arginase had verifiable effects on cancer in terms of convincing tissue changes or tumor arrest.

### 6. Experimental Evidence Developed by the Cancer Commission and Independent Investigators

Immediately after the publication of the "Symposium on Arginase in Cancer Research" referred to in the introduction, the Cancer Commission made extended efforts to secure some arginase for research purposes. Some of the drug was promised but none was forthcoming for several weeks. Finally, through the kind services of Dr. Cecil Cutting, Mr. Vrat made available sufficient arginase for Dr. Winsor Cutting to treat two mice that had cancer. The mice died of cancer. Subsequently Dr. Cutting checked the findings on 30 animals, with similar results.

Dr. A. C. Griffin, associate professor of biochemistry, Stanford University, informed the secretary of the Commission on September 24, 1952, that he had completed three series of studies of the effect of arginase on leukemic mice. He wrote: "Right now, I am of the opinion that this drug has little effect on the course of the leukemia with which we are working."

Dr. M. B. Shimkin reported in 1951 that Dr. David Greenberg, professor of biochemistry at the University of California and one of the world's outstanding authorities on arginase, could not confirm shrinkage of tumors in experimental animals with cancer. The animals died of cancer in the usual manner.

Dr. C. C. Stock, chief, Division of Experimental Chemotherapy, Sloan-Kettering Institute for Cancer Research (Memorial Center for Cancer, New York City) conducted a series of tests in conjunction with Dr. Irons in 1953, injecting groups of cancer-bearing animals ( $C_3H/ba$  mammary adenocarcinoma in  $C_3H$  mice) with arginase supplied by Dr. Irons. No significant inhibition in growth and no tumor regression was observed. (Letter to Cancer Commission, June 15, 1953.)

#### *7. Clinical Evidence Developed by the Cancer Commission*

On January 17, 1952, a subcommittee of the Commission (chairman, Dr. Ian Macdonald) addressed a formal request to Dr. E. F. Boyd to review his work with arginase in the treatment of patients with cancer. This request resulted in the meeting above referred to.

Since that time the Commission has attempted to maintain a follow-up of the cases, with little cooperation from the proponents. Of the original 20 patients discussed at the Hollywood Hospital meeting, three were already dead of cancer at the time of the meeting; three are known to have subsequently died of cancer (cases 4, 9, and 16). Two, apparently well (cases 8 and 13), had surgical removal of the lesion. One had no evidence of disease when arginase was given (case 17). In the remainder there was no objective evidence of improvement.

Members of the Commission have reviewed the following cases or case histories:

(21) Male, child with "sarcoma of the pleura." Treated by Dr. Boyd in Los Angeles in 1952 and x-ray films interpreted as showing calcification of the tumor after three weeks' treatment. Died, within some weeks' time with disease uncontrolled.

(22) Female, with carcinoma of the breast treated by Dr. Ream in Alameda County. Died with extensive metastasis (autopsy).

(23) Male with carcinoma of the rectum. Treated by Dr. Ream. Died with extensive persistent tumor (limited autopsy).

(24) Male, said to have adenocarcinoma of the scalp, metastatic from the intestinal tract. Treated with arginase and lesion "arrested." Subsequent abdominal laparotomy for bleeding peptic ulcer. No carcinoma of bowel found. No verified primary tumor.

(25) Male with operable carcinoma of rectum seen in consultation by Dr. Phillips Johnson. Treated with arginase; tumor became larger. Patient finally agreed to exploration and resection. At time of operation metastases were found in liver.

(26) Female, with carcinoma of rectum, seen by Dr. Robert Scarborough in consultation. Patient had been given arginase by her family physician in 1950 and 1951 and had been told the tumor was "shrunk to fibrous lumps." Upon exploration in October 1951, very extensive inoperable carcinoma was found. The patient died in May 1952 after considerable distress. The sections were reviewed by Dr. David Wood, pathologist, and reported as typical of adenocarcinoma without any evidence of specific arginase effect.

The files of the Hollywood Presbyterian Hospital disclose that 120 patients had received treatment with arginase during 1951-52. The names of these patients were checked against the death records of the State Department of Public Health in May 1953. In 70 cases, cancer was listed as the cause of death. This does not include all the cases dead of cancer, since some had out of state residences and returned thereto prior to decease.

#### *8. Autopsy Data Reviewed by Commission*

The autopsy data on the cases above referred to show, in the opinion of experienced pathologists, no evidence of specific effect of arginase on cancer. Microscopic sections available on the ten patients reviewed by the Hollywood Presbyterian Hospital Committee have been studied by Drs. Fred Stewart and Frank Foote of the Memorial Center in New York, by a pathologist on the staff of the University of Rochester Medical School, and by Dr. Harry Goldblatt, director, Institute for Medical Research, Cedars of Lebanon Hospital. None of them was able to report any specific or unusual microscopic findings indicative of specific change in the neoplasms from the treatment given.

#### *9. Consultant and Other Reports*

The Cutter Laboratories of Berkeley assigned a full-time research worker to observe the arginase work at the Hollywood Hospital in February 1952. On April 3, 1952, Mr. F. A. Cutter wrote to the Cancer Commission, "... we found insufficient objective evidence of therapeutic value to cause us to divert our current research from other channels. We therefore terminated what has amounted to an option on a license agreement."

In the 1952 annual report of Cutter Laboratories to stockholders this was referred to as follows:

"Some of the company's stockholders have asked what made Cutter's stock go up so fast early in the year and what made it fall the same way later in the year.

"An unfortunate rumor got started that we were on the verge of coming out with a cancer cure. Like most rumors, there was a grain—but only a grain—of truth in it.

"We were investigating a so-called cancer cure which turned out disappointingly, as have dozens of other similar products we have investigated in the past. When this became known, quite a few sold stock and toward the end of the year, when the stock was down, there was further selling, presumably to establish capital losses."

The Cancer Committee of the Hollywood Presbyterian Hospital after reviewing the cases treated by Dr. Boyd, recommended in March 1952 that no further patients be treated with arginase; this was approved by the medical advisory board of the hospital and accepted by its administration. The latter decided that, until the original animal experiments could be confirmed by competent authorities, no further patients were to be treated.

The cases presented and the case histories discussed by Dr. Boyd at the February 1952 meeting of the Hollywood Presbyterian Hospital Cancer Committee were reported to and reviewed by the Cancer Commission of the California Medical Association at its regular meeting in Los Angeles, April 26, 1952. Dr. Robert Scarborough, then chairman of the Commission, was authorized to state that: "*All available evidence to us indicates that arginase has no beneficial effects in the control of cancer in experimental animals or in patients. To date, it must be concluded that arginase is valueless.*" This statement was released to the press, and was published in California newspapers in April 1952.

#### 10. Conclusions of the Commission

Arginase (also termed hepasyn) has been advocated for the treatment of cancer. The current proponents have claimed "near miraculous results."

The Cancer Commission has collected information on more than 26 patients treated with arginase, at least six of whom are now dead with the disease. Of those alive, no patient has been found with objective evidence of control of cancer under treatment with arginase or hepasyn alone.

The hospital in which the treatments were given in 1951 and 1952 lists 120 patients as having received arginase; by May of 1953, 70 of these patients were known to be dead with cancer.

Autopsy studies disclosed no evidence of specific chemotherapeutic effect.

There is no evidence to date that arginase (or hepasyn) has a beneficial effect on patients with cancer.

#### REFERENCES

1. Vrat, Ved: Symposium on arginase in cancer research, Permanente Foundation Med. Bull., 9:49-70, 1951.
2. Irons, W. G., and Boyd, E. F.: Arginase as an anti-carcinogenic agent in mice and human beings, Arizona Med., 9:39-44, 1952.

## Council Meeting Minutes

*Tentative Draft: Minutes of the 401st Meeting of the Council, San Francisco, July 25, 1953.*

The meeting was called to order by Chairman Shipman in the Golden Empire Room of the Hotel Mark Hopkins, San Francisco, at 9:30 a.m., Saturday, July 25, 1953.

#### Roll Call:

Present were President Green, President-Elect Morrison, Speaker Charnock, Secretary Daniels and Councilors West, Wheeler, Loos, Sampson, Pearman, Dau, Ray, Shipman, Lum, Bostick, Teall, Varden, Heron, Frees, Carey, Kirchner and Reynolds; absent for cause, Vice-Speaker Bailey and Editor Wilbur. A quorum present and acting.

Present by invitation during all or a part of the meeting were Messrs. Hunton, Thomas, Clancy, Gillette and Pettis of C.M.A. staff, legal counsel Hassard, Mr. Ben Read of the Public Health League of California, county society executive secretaries Watson of Sacramento, Wood of San Mateo, Donovan of Santa Clara, Jensen of Fresno, Geisert of Kern, Nute of San Diego and Bannister of Orange; Mr. K. L. Hamman of California Physicians' Service; and Drs. D. H. Murray, Wilton L. Halverson, John R. Upton, Francis J. Cox, Dan O. Kilroy, Christopher Leggo, John M. Kenney and James Doyle.

#### 1. Minutes for Approval:

(a) On motion duly made and seconded, minutes of the 399th Council meeting, held May 23-27, 1953, were approved.

(b) On motion duly made and seconded, minutes of the 400th Council meeting, held May 28, 1953, were approved.

#### 2. Membership:

(a) A report of membership as of July 18, 1953, was received and ordered filed.

(b) On motion duly made and seconded, one 1952 delinquent member and 57 members delinquent in 1953 were voted reinstatement.

(c) On motion duly made and seconded in each instance, eight applicants were voted Associate Membership. These were: Gordon Diddy, Fred C. Tongue, Glenn A. Young, Fresno County; Jeanne B. Blumhagen, Rex V. Blumhagen, Madera County; Merall Roth, Bernard M. Stone, San Francisco County; Helen M. Safford, San Joaquin County.

(d) On motion duly made and seconded in each instance, four applicants were voted Retired Membership. These were: Alfred M. Palmer, William Henry Sargent, Alameda-Contra Costa County; Philip Stephens, Los Angeles County; Lloyd D. Mottram, Stanislaus County.



(e) On motion duly made and seconded in each instance, a reduction of dues was granted to nine applicants who are suffering from protracted illness or undergoing postgraduate studies.

### 3. *Financial:*

(a) A report of bank balances as of July 18, 1953, was received and ordered filed.

(b) Mr. Hunton reported on his correspondence with New Mexico Physicians' Service and this was ordered filed.

### 4. *House of Delegates Actions:*

The Council reviewed two resolutions referred to it by action of the 1953 House of Delegates.

On Resolution No. 6, it was duly moved, seconded and voted to publish a map of California outlining the service areas of physicians in all parts of the state, to advise Dr. Burt Davis, author of the resolution, to this effect and inquire if such a map meets his request for a survey of medical service areas, to seek publicity on the Association's placement activities and to urge the Committee on Rural Health to continue its cooperation in the placement of physicians in areas of need.

On motion duly made and seconded, it was voted to request the C.M.A. Delegates to the A.M.A. to introduce resolutions in the A.M.A. looking toward a study of areas in need of additional medical service in all states.

On Resolution No. 7, introduced by Dr. Burt Davis, it was duly moved, seconded and voted to table.

### 5. *Medical Services Commission:*

Dr. Teall reported that the Medical Services Commission was considering its role in handling the recommendations of the C.P.S. Study Committee report, now referred to the commission. It was generally agreed that the commission was to serve as a source of information for the county societies, using all means at its command.

The matter of communication of news was also discussed, and it was regularly moved, seconded and voted to expand the publication *Rx Reading* to include current items on health insurance and other factual material.

Dr. Teall also gave an illuminating report on his attendance at the meeting of the Cooperative Health Federation of America.

### 6. *Blood Bank Commission:*

Dr. Upton reported that four of the blood bank system banks had not secured a renewal of their contracts for production of blood for defense. He stated the commission was working with the Hemophilia Foundation of America for the supply of antihemophilia blood.

Dr. Upton suggested that legislation be secured to provide property tax exemption for premises used for non-profit blood banking purposes.

The blood banks in the system have produced 495,541 units of blood for defense and 54,647 units for civilian purposes since the current defense program started.

### 7. *Committee on Industrial Accident Commission:*

Dr. Francis J. Cox gave a progress report and expressed the hope that a more adequate schedule of industrial fees may be achieved in the very near future.

### 8. *Group Disability Insurance:*

Dr. Kirchner discussed the proposed program of disability insurance for Association members. Letters of approval or disapproval of the program from the insurance committees of several county societies were read and discussed.

On motion duly made and seconded, it was voted to approve the group disability insurance program proposed by the Lumbermans Mutual Insurance Co., through its broker, Charles O. Finley Co., for presentation to members of the California Medical Association.

### 9. *Committee on Industrial Health:*

Dr. Christopher Leggo, chairman of the Committee on Industrial Health, presented a revised statement of principles on nurses in industrial plants, previously approved by the Council and subjected to slight editing by the California State Nurses Association. Subject to Council approval, this statement could be issued jointly by the two associations. On motion duly made and seconded, the revised statement was approved.

Dr. Leggo also called attention to the fact that some physicians are declining from 25 to 43 per cent of job applicants where there is a history of back pain and the new employer may be held liable for its aggravation. He suggested this condition be watched over in coming months as a possible source of economic reaction due to the unemployability of the rejected applicants.

### 10. *Public Relations:*

Mr. Clancy reviewed the television program inaugurated July 12, 1953, as a public service program under the sponsorship of the Los Angeles County Medical Association and the California Medical Association. With minor changes this program could be made into a C.M.A. program suitable for telecasting in any area of the state.

A film reproduction of the initial telecast was shown.

### 11. *State Department of Public Health:*

Dr. Wilton L. Halverson, State Director of Public Health, reported an anticipated increase of polio-

myelitis cases in 1953 over the 1952 total of about 4,000. However, the incidence of paralysis is running about 46 per cent this year, compared with about 64 per cent in 1952. He discussed the use of gamma globulin for both mass inoculations and treatment of family contacts of clinically diagnosed polio cases, stating the greater chance of immunization lay in the family contact groups.

On motion duly made and seconded, the Committee on Public Health and Public Agencies was authorized to cooperate with Department of Public Health in the event of mass inoculations and to seek further cooperation from the county societies.

Dr. Halverson reported the incidence of encephalitis appeared low this year.

#### 12. *Health Education:*

Dr. John M. Kenney, Santa Rosa, discussed the need of cooperating with the schools and other agencies in fostering adequate and accurate education on health subjects. The subject was taken under advisement.

#### 13. *Legal Department:*

Mr. Hassard gave a progress report on the San Diego lawsuit, on which final briefs have been filed and oral arguments made before the appeals court.

#### 14. *California Physicians' Service:*

Dr. Heron reported 605,274 beneficiary members and 11,157 physician members of California Physicians' Service as of June 30, 1953. The beneficiary membership showed a gain of 29,330 for the second calendar quarter. He also reported progress in the joint meetings between C.P.S. and Blue Cross representatives and stated that one basic contract has been developed to replace seven types of contracts previously used. Additional benefits may be added to the basic contract in specific instances. Mr. K. L. Hamman presented a financial report.

#### 15. *Public Policy and Legislation:*

Dr. Dwight H. Murray and Mr. Ben H. Read gave a report on legislation adopted by the state's 1953 legislature and now pending before Congress. It was pointed out that all measures sponsored by the C.M.A. in the 1953 state legislative session had been adopted and signed into law.

#### 16. *Advisory Planning Committee:*

Mr. Hunton reported the Advisory Planning Committee had met July 24, had approved the kinescoping of the Los Angeles television program for use in other areas and had approved the issuance of a new "Welcome" pamphlet to be sent to new members of the Association.

## Proposed Constitutional Amendment

### *(First Publication)*

Following is the proposed amendment to the Constitution of the California Medical Association that was introduced at the 1953 Annual Session and was carried over for action at the Interim Session. It has been referred to Reference Committee No. 4, which is to make its report upon it available to delegates at least 30 days before the opening of the 1953 Interim Session in San Francisco, December 12, 1953. California Medical Association members who wish to record opinions on the proposed amendment may send them to the chairman of Reference Committee No. 4, Albert G. Miller, M.D., 77 San Mateo Drive, San Mateo.

Submitted by Sidney J. Shipman, for the Council, May 24, 1953.

*Resolved:* That Article III, Part A, Section 1 of the Constitution of this Association, the California Medical Association, be amended by striking out the word "District" in subsection (c) of said Section 1, so that Section 1 will read as follows:

#### Section 1—Composition

"The House of Delegates shall consist of:

"(a) Delegates elected by the members of the component societies;

"(b) Officers of the Association as hereinafter provided;

"(c) Ex-officio, with the right to vote, the Councilors, and

"(d) Ex-officio, without the right to vote, the Past Presidents."

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#### 17. *Committee on the Unlawful Practice of Medicine:*

Dr. Shipman made a progress report on the activities of the Committee on the Unlawful Practice of Medicine.

#### 18. *San Diego Television Program:*

On motion duly made and seconded, it was voted to provide consultation service to the San Diego County Medical Society in the production of a television program to originate there.

#### 19. *Orange County Medical Association:*

On motion duly made and seconded, it was voted to extend to the Orange County Medical Association the sincere thanks of the Association for having performed an outstanding job in rechecking the physical status of 50,000 Boy Scouts prior to their admission to the Jamboree held in Orange County. It was pointed out that 201 Orange County members had signed up to do the rechecking and all but one or two appeared as scheduled.

#### 20. *Use of C.M.A. Mailing List:*

On motion duly made and seconded, it was voted to approve the use of the Association's mailing list by the San Francisco Heart Association in publicizing a scientific meeting.

#### 21. *World Medical Association:*

On motion duly made and seconded, it was voted to appropriate \$1,000 toward the activities of the World Medical Association. A three-fourths vote noted.

#### 22. *Committee on Rural Health:*

On motion duly made and seconded, it was voted to approve the plan of Dr. Henry Randel, chairman

of the Committee on Rural Health, to seek the names of additional committee members for appointment by the Council.

#### 23. *Vocational Nursing:*

Dr. Morrison reported on a meeting with an organization of vocational nurses and it was agreed he should maintain this contact.

#### *Adjournment:*

There being no further business to come before it, the meeting was adjourned at 6:25 p.m.

SIDNEY J. SHIPMAN, M.D., *Chairman*

ALBERT C. DANIELS, M.D., *Secretary*

## **Nursing Services in Industry**

*A statement of principle made jointly by the  
California Medical Association and the  
California State Nurses Association*

THE CALIFORNIA MEDICAL ASSOCIATION and the California State Nurses Association have reviewed the contribution to industrial health made by the members of the nursing profession through the individual activities of the nurses employed by and in industry. Through their contact with individual employees and with members of management, nurses have furthered public health education, the use of community resources, improved personal and plant hygiene, healthier psychological relationships between management and workers, and a closer liaison between the plant employee and the practicing physician.

It is also recognized, however, that demands are made by both employees and management upon nurses in industry to engage in activities which appear to encroach upon the practice of medicine as defined by the California Medical Practice Act. If the nurse accedes to these demands, she is jeopardizing her professional status and her very livelihood.

It is urged that the nurse in industry, having met a particular emergency with which she is confronted, protect herself, her patient and her employer by referring the patient to a physician for diagnosis or medical care when either is required, and that further treatment be carried on only under such medical supervision. Employers of nurses are urged to facilitate and encourage such referrals, in order that they themselves may be protected against being involved in violations of the Medical Practice Act.

Technicalities of the Medical Practice Act are difficult to translate into lay language and no simple definition can be given as to what services may be rendered with impunity. It certainly may be said, however, that any injury serious enough to cause even temporary disability or which requires more than protective dressing, or which does not respond favorably to procedures which are commonly considered to be emergency nursing procedures requires medical treatment.

It must be borne in mind that, regardless of the wishes of the patient or his personal needs, or the demands of the employer in regard to industrial injuries, a nurse is forbidden by law to either diagnose or treat medical conditions or surgical injuries. Only as this fact is fully understood by employees and employers alike will the pressure upon the nurse to exceed her functions be lessened.

It is essential that every nurse and her industrial employer be thoroughly conversant with the Medical Practice Act and its implications. It must be remembered that the law cannot be ignored. A violation remains a violation whether committed ignorantly or knowingly.

The California Medical Association and the California State Nurses Association anticipate and welcome the further extension of employment of nurses in industry in view of their contributions both to the overall health and to the physical and emotional welfare of employed individuals. Both organizations look forward to establishing and maintaining the area in which the professional industrial nurse may function effectively, efficiently, ethically and legally.